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ABSTRACT

To develop a new model of the reading process, a longitudinal study investigated the importance of the concepts of cohesion and register (fiction or nonfiction) in the assessment of text readability. Subjects, 436 8-year-olds (Cohort A), 474 10-year-olds (Cohort B), and 445 13-year-olds (Cohort C) from 23 urban and rural British schools--most of whom were average readers--participated in a silent reading comprehension project using extracts from school texts and in near normal classroom situations. Initial test results revealed that reading ability was best accommodated along a continuum rather than being related to the child's age. Findings also suggest that the large data bank of responses provided by the tests allowed analysis of chapter parts or whole chapters of books. It was also possible to map the chaining in the responses and then to compare those chain patterns with examples of similar situations in the data bank. Results suggest the possibility of advising publishers and authors on those areas of the text where readability is unclear and where learning is likely to be problematic. (Eight figures are included, and 34 references are attached.) (NKA)

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The Importance of Cohesion in the Assessment of Readability

Summary paper presented to the Readability Special Interest Group at the 31st Annual Convention of the International Reading Association 13-17 April, 1986.

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Abstract

This paper reports significant assessment procedure developments which have resulted from a longitudinal reading research programme. A feature of this programme included the concepts of cohesion and register in a new model of the reading process. The paper summarises the procedures evolved during the work and shows how they can be used to provide researchers, publishers and teachers with new and improved ways of assessing children's reading performance and the readability of texts.

Introduction

In his recent authoritative statement on readability, Klare (Klare, 1984) clarifies some of the confusion that has arisen over the years as to the meaning of, and factors associated with readability. Following present day usage of the term he takes readability to mean 'qualities of writing which are related to reader comprehension'. Whilst this is also the overall meaning favoured here, a very important distinction is made regarding the meaning of comprehension which, as Klare also points out, has many definitions. In the research to be reported the view is taken that reading educators must now concentrate on the process of comprehension rather than the product of comprehension. Comprehension as a product, that is the understanding of a text that is revealed by measurements carried out after reading has taken place, is more the concern of teachers in their role as examiners than when they are instructing. What teachers need to know in order to instruct and what publishers need to know to produce readable publications is what it is that takes place during the reader's

interaction with the text. To distinguish between the two usages, the term comprehending, as discussed with Chapman (1983a), will be employed to cover the dynamic process of comprehending.

Klare also makes a further distinction between prediction and production in readability studies. He remarks of production that 'much more goes into writing than word and sentence considerations'. Mindfull of this and the dissatisfaction with readability formulae expressed by many, when a large longitudinal research project was begun in 1979, it employed recently described text-linguistic features of cohesion and register to account for linguistic features beyond the sentence. This on-going research has as its main aims the investigation of the nature of comprehending and the assessment of children's reading growth in terms of the books actually read in schools. The results so far obtained from this work have required a revision of present ways of conceptualising the reading process and its assessment.

However, before outlining some of these results, it is important to state the linguistic principles involved and then to show how they can be accommodated in a revised model of reading which is psycho-sociolinguistic in character.

Halliday's linguistic principles within a psycho-sociolinguistic model of reading

In order to understand the theoretical underpinning of this research it is important first to relate the proposals of Halliday and Hasan that make up the linguistic part of the model. Much of the prolific

work of Halliday could be commented upon but that would be far beyond the scope of this article. All that can be accomplished here to illustrate his approach is to mention two, relatively new but important concepts, those of textual cohesion and register. However, in order to appreciate what psychological factors these concepts might involve, it is necessary to go further and outline briefly their position within Halliday's description of language.

While agreeing with most linguists that language is best characterised as a tri-stratal system, (semantic or meaning, grammatical or lexico-grammatical and phonological/graphological), Halliday's main tenets are that language is both a social and functional process.

He suggests that there are three major functional components contained within the semantic, or meaning, component of language. He calls these the Ideational, the Interpersonal and the Textual. (Halliday and Hasan, 1976: 27.) The Ideational component expresses 'content, is about something', the Interpersonal is concerned, as the name implies, with social, expressive and conative functions and the third component, is the Textual, or text-forming component of the system. Whilst the three are interdependent it is this latter textual function that is of interest.

For Halliday, text, be it spoken or written, has a semantic function: a text is thereby a unit of meaning. In other words to understand language from a functional perspective involves speaking of the language user making meaning, or, in terms of children developing their first language, they are learning how to mean (Halliday, 1975). This, as will be readily appreciated, is an active approach that fits

easily alongside the tradition in schools of learning through activity and experience. Language is considered to be for use: it is not something out there to be acquired but it is by actively learning how to mean through the medium of language that the child learns to communicate. When considering reading this is an important new perspective which fits particularly well with contemporary thinking that considers reading to be a psycholinguistic or 'meaning getting' process. (Smith,1978 and Goodman, 1967)

The textual component

This Hallidayan concept is rarely, if ever, met with in psychological studies of reading. Considering the extent of interest there is in the comprehension of texts, it is strange that it has not been more to the fore as a theoretical construct for explaining text production and comprehending.

Figure 1 about here

The textual component comprises three sub-components: the theme/rheme structure of the clause or sentence, the information system which signals the given/new distinction in the message and is carried by intonation and cohesion. This latter element, along with register was the focus of this research.

Cohesion

The proposals for cohesion were set out in Halliday and Hasan (1976) and have since had a seminal effect on research, some of which seeks the psychological reality of these newly described language features. (See Irwin, 1986 and the references below.) Cohesion is said to be the means whereby items, that are not otherwise accounted for by syntactic analysis, are linked together through their interdependence on one another for their interpretation. It is suggested that the meaning of one such element in a text cannot be completely decoded without recourse to another. The term used by Halliday and Hasan (1976:3) to refer to a single instance of cohesion, the term for one occurrence of a pair of cohesively related linking items, is a cohesive tie.

The constituents of cohesion

It is important to notice at this point that since the 1976 presentation, the description of cohesion and register which together are said to make up the textuality or texture of a text, have been extended and put more clearly into the context of Hallidayan functional grammar (Halliday and Hasan, 1976, 1980, Hasan 1984, Halliday 1985.)

Cohesive ties can be arranged in five groupings: reference, substitution, ellipsis, conjunction and lexical cohesion. These original five have been reduced to four, substitution being subsumed by ellipsis (Halliday and Hasan, 1980). These four groupings of ties are assigned three

basic operations, that of co-reference (ties of reference and ellipsis) conjoining (conjunction ties) and co-extention (the lexical or vocabulary ties). It is proposed that co-reference and co-extension operate mainly by chaining, an important concept for the process of comprehending.

Anderson (1983) suggested that coreference is the method used by authors to keep track of people, objects and places in a text. This he attributes to the reference and ellipsis/substitution cohesive ties. Co-extension is the selection of lexical items for a particular content and purpose and is carried by the lexical cohesive ties. Conjoining, the ways parts of the text are logically related, is achieved, as the name implies, by the conjunction cohesive ties.

In order to use this sytem of ties empirically and to explore how it might fit into a model of the reading process, it is necessary to know the detailed working of a cohesive tie. This is said to operate according to the principle of presupposition.

Presupposition

Presupposition is the main mechanism used for the creation of cohesion in a text. And it is via this mechanism that the linguistic description has psychological implications. Halliday suggests that to achieve a cohesive effect some element in the text presupposes another so that the two elements, the presupposing and the presupposed are thereby, at least potentially, integrated into the text.

Presupposition in the sense used here, can be related to recent thinking in the study of reading as it goes a long way to explain the process of prediction or expectancy that comprises a large part of the reading process (Smith 1978). In essence the reader, on perceiving the onset of a cohesive tie knows not only from the content, which may often be misunderstood, but also from his knowledge of the language that the other end of the tie will inevitably follow regardless of the distance in terms of words, sentences or even paragraphs that separate the beginning and the end of the tie. In other words readers can retrieve the meaning if they have become aware of, or have been taught to be aware of, these linguistic features. Furthermore, if the authors of the books they are reading also pay attention to these features the readability of their books will be so much the clearer. It is proposed therefore that it is the ability of readers to tie the tie that enables them to comprehend that part of the text both within and often beyond the tie. It will be realised that this linguistic proposal will involve such psychological factors as short-term or working memory.

An illustration of how this works can be taken from the personal reference system. Normally, the name to which a pronoun refers, the antecedent, is announced first, for example, at the beginning of a story. Readers are primed by their knowledge of the pronoun system in English to anticipate that a person thus named will be referred to thereafter mostly by pronouns. These pronouns and other cohesive items are chained through the text such that the perception of their linkages (the ties) enables the reader to keep track of people, things

or events in a text. However, this is often not straight forward. There may be changes in the participants, or instance, yet the pronoun remains exactly the same word. This is particularly noticeable with plurals like 'they' where readers need to up-date the constitution of the group to which 'they' refers constantly. Furthermore, some of the ties span a considerable number of words, sentences or even paragraph boundaries. This tie distancing has been codified by Halliday and Hasan (1976: 339) as immediate (the tie is tied in the following sentence), mediated (another tie of the same or other group of ties stands between the beginning and end of the tie) and remote (at least one sentence between the onset and closure of the tie). The processes of expectancy or anticipation of tie closure and the tracking of the cohesive chains which derive from the linguistic base are seen therefore, to involve psychological factors during comprehending. However, this particular linguistic description as was noted above is social semiotic in character so the model needs to become an interactive psycho-sociolinguistic model of the reading process.

Whilst the other cohesive tie groupings have the same basic mechanism as co-reference, co-extention and conjoining work slightly differently.

Co-extention is carried in the main by lexical cohesion or the author's vocabulary choice. Here the notion is that words that have close associative relationships are more likely to co-occur in the same text environment than others that have little or no associative force. If the topic concerns avalanches for example, words like 'snow' and 'ice' are more likely to co-occur than words bearing no such associative

relationship. In linguistic terms they are said to be collocated, however this term implies much more than simple word association. Some collocations are oft used phrases that are so predictable and their force so great that young readers often give them prominence over other words that actually appear in the text. In order to operationalise the cohesive tie system and to avoid too great an element of subjectivity, lexical items are counted as chain links only if they satisfy the semantic relationships of synonymy, antonymy, hyponymy or the part-whole relationship of meronomy.

There are additional differences in the way that the conjoining cohesive ties work. They share the same basic presupposition mechanism but do not perform in the same way as the co-reference and co-extention ties. The conjoining ties indicate, or clearly specify ways in which the meaning relations expressed by the clauses are systematically connected with what has gone before. Sometimes the logic of the meanings carried by the clause structures allows their junction to be implicit; sometimes the conjunction cohesive tie is used to confirm the nature of that junction; sometimes it specifies the meaning connection very clearly indeed. Originally, four areas of meaning relations were covered by these ties, additive, adversative, temporal and causal. These have been revised and extended more recently in Halliday (1985).

Register

It was noted earlier that the concept of cohesion was closely related to another concept, that of Register. These two are said to account for the 'texture of text'. Unlike cohesion, which is concerned with the internal unity of the text, register accounts for the relationship of the text to its content. In other words, register is that property of text that signals the appropriateness of the text to the situation of its existence. As well as the major difference between fiction and non-fiction, many of the register distinctions found in schools are to do with the academic disciplines. There is some evidence also that cohesion varies according to the style of the writer (Gutwinski 1976) as well as academic subject (Binkley 1983).

In summary cohesion, or text unity, is a global quality of text that operates within an appropriate register. It is accounted for by a series of interlocking linguistic features, the cohesive ties, which indicate the meaning relationships that exist within the text. Many of these ties are chained so as to keep track of people, objects and events. Others, which are charged with associative values, form lexical chains. The conjoining cohesive ties indicate or confirm a series of logical or other meaning relationships. All operate by a process called presupposition and must be perceived within a variety of registers which relate the text to its social context and purpose. These factors, together with the monitoring processes involved by the chaining system, make up part of a revised psycho-sociolinguistic model of the reading process.

To avoid confusion it is as well to point out that the position taken here with regard to the psycholinguistic part of the model is not the early version that regarded reading as an entirely 'top-down' or meaning dominated process. Rather it is an interactive one, such as proposed by Stanovich (1980) involving also bottom-up, or text driven factors. Those familiar with Hallidayan systemic grammar will realise its affinity with 'bottom-up' processing through its constituent analysis procedures. And this is where the model differs from previous psycholinguistic research which often used Chomskyan transformational grammar for its linguistic input. This is now considered to be inappropriate in many ways for reading research as it is limited to the sentence which is clearly inappropriate for text processing. In addition much of the work aimed at substantiating the psychological aspects of Chomskyan grammar were unsuccessful. This new definition therefore, replaces transformational grammar with an entirely different linguistic description, which is functional and social in orientation. As will be seen below the model is supported by empirical results. But first a summary of the evidence from cohesion research related to reading.

Cohesion research related to reading

As little of the cohesion research that has been done has been reported is in theses and many journals, a summary of the findings of a number of studies that are pertinent to reading is given here.

Evidence from these indicate that:

* the ability to perceive and process cohesive ties is associated with reading proficiency and comprehending. Chapman (1979a, 1979b, 1983), Nunan (1983b), Hadley (1985) and Smith (1985).

* the perception of cohesive ties is subject to a developmental pattern. Chapman and Stokes (1980), Chapman (1983a and 1983b), Anderson (1983a), Hadley (1985), Moberly (1978).

* the pattern of development is related to cohesive tie types so that the order in the early years from easy to difficult is: reference, lexical cohesion, substitution/ellipsis, conjunction. Moberly (1978).

* the number and types of cohesive ties affect text recall. Irwin (1980) and Smith (1985).

* of the distance factors, immediate, mediated and remote, it is the remote inter-sentential or textual ties that are significantly difficult to process. Moberly (1978), Nunan (1983a).

* anaphoric reference embedded in direct speech is more difficult to recognise than it is in other forms. Hadley (1985).

* there are sex differences in the ability of children to handle cohesive ties efficiently. Moberly (1978).

* there are indications of differential effects according to the register of the text. Binkley (1983).

* the relationship of cohesion and register to text comprehension is affected by cultural knowledge, assumptions and beliefs. Steffenson (1986).

* cohesive tie perception as an addition to miscue analysis has diagnostic possibilities. Worrall (1985), Smith and Elkins (1984).

* very different methods have been used to uncover the above effects and relationships; a modified cloze procedure has been particularly efficient in this respect. Moberly (1978), Nunan (1983b), Chapman (1979c, 1981, 1983b), Smith (1985), Bridge and Winograde (1982), Irwin (1980), Anderson, E. (1983), Hadley (1985), Worrall (1985), Steffenson (1986).

Method

Subjects

In order to glean information about reading development, one of the main aims of the research, it is necessary to observe many children of different ages reading the texts they use day by day in the classroom. It is also preferable if these observations are made longitudinally. That is, the type of data required needs to be collected from the same children as they go through the school system. It was beyond the resources available however, to attain the ideal of following children's progress throughout their entire school careers, but it was possible to select three groups of children aged 8, 10 and 13 years and to follow each of these groups for a three year period. The initial sample needed had to be large and arrangements were made with two English Local Education Authorities, one urban and one mostly rural, to work with some 1,500 children.

There were twice as many children in the urban schools as in the rural area. There were few children in the sample for whom remedial reading had been prescribed or children whose mother tongue was other than English. The sample, therefore, consists largely of children making at least average progress in reading, the majority being through the initial stages.

At the beginning of the data collection the children were allocated by class groupings into three Cohorts. The second year junior children (8 years) comprised Cohort A, the 4th year junior children (10 years) Cohort B and the 2nd year secondary children (13 years) Cohort C. At the conclusion of the first data collection the number of children having completed all the tasks were Cohort A - 436, Cohort B - 474 and Cohort C - 445. The children were drawn from twenty-three schools in the first year of the project. These large groups were necessary to give a spread of ability and to meet the decline in numbers anticipated due to movement, illness and other causes during the three years.

Materials

It is not difficult to put together a representative collection of texts from across the subjects in a modern curriculum for different age levels. It is much more difficult to design a method to find out how those texts are being comprehended as they are being read. As the reading process is not directly observable, methods have to be employed that will enable the researcher to infer what is happening.

Characteristics of the methodology

It was deemed most important for the study to have ecological validity. This is most important not only on theoretical grounds but so that teachers would give it credence. It is also argued that research that has an applied purpose involves basing the research on the materials most often used in schools in different age groups. There are, furthermore, good reasons to suppose that it is the texts themselves that are posing some of the problems for the readers. (Harrison, 1979) To write special materials designed to control such variables as word frequency or syntactic structure for example, would, it is suggested, provide the research with a false background from the start. There would be no guarantee that the results would transfer to the real world if this procedure were followed. It was decided therefore, to work with texts obtained from schools and collect data in as near normal classroom situations as could be arranged, difficult as this would be.

The second major methodological problem was to obtain data on the covert process of silent reading itself. To do this, it is necessary in the first place to obtain a response of some kind so that observations can be made. The cognitive processes involved in reading are unseen (or unseeable) and all such observations, no matter the method, will necessitate that inferences be made by the researcher as to what is happening. In reading, particularly reading passages of some length silently, it is impossible to enter the process directly without stopping and thereby altering the process. For reading is essentially dynamic and to stop it prematurely only

halts the processes involved without illiminating them. This is particularly crucial when the factors of cohesion, which is to do with recovering the unity of the text and its register, are concerned. Furthermore, to adopt the traditional practice of waiting until the text has been read in its entirity and then ask questions not only calls for the inferences already referred to but has additional complications, such as those related to the reader's prior knowledge for that particular content information. In addition, the types of comprehension questions asked to infer the reader's understanding may also prove an additional complication. Comprehension assessed by questions has been bedevilled by problems of this kind as so clearly identified in the work of Tuinman (1973/1974). And finally, and most importantly, testing reading in this way tells us very little about the comprehending process. It was decided therefore, that a new methodology would be needed. Such a methodology would employ the concepts of cohesion and register to uncover the extent of the underlying and developing textlinguistic knowledge of children in the age range 8 to 15 years during reading.

The starting point for this methodology was Goodman's miscue analysis (Goodman 1973) which is one of the most successful methods to date for observing the reading process and is a method which avoids many of the problems mentioned above. In this the reader reads aloud passages which are difficult enough to generate a sufficient number of errors or, as Goodman prefers to call them, miscues. These errors are then analysed for their probable origins according to a tri-stratal cueing system, graphophonic, syntactic and semantic. This gives the

observer considerable information regarding the strength or otherwise of the reader's underlying textlinguistic base. Using this technique it becomes possible to examine a child's reading performance without upsetting its dynamic quality. As Goodman puts it, it provides the researcher with 'a window on the reading process'. However, it has to be applied individually and its time-consuming nature will inhibit the number of children and texts needing to be examined. For the purposes of a longitudinal project with large numbers of children and requiring the investigation of many texts, the cost would be prohibitive as many trained observers would be needed over long periods of time. What was required by this project therefore was a method that allows many texts of some length to be read silently by many children in normal classroom conditions yet retaining the ability to detect textlinguistic growth.

To meet these demands a new type of error analysis procedure was evolved, which retains Goodman's notion of a 'Window on the reading process' but allowed group presentation. Instead of, as it were creating problems in the child by presenting too difficult texts, in this method the child is asked to read the same texts that have been selected by their teachers as being suitable for day to day use but that have been 'adjusted'. This adjustment was done by removing one end of a cohesive tie from the text so as to create a gap, the presence of which was indicated by double lines of standard length. The cohesive ties chosen for this were considered to be part of a prominent chain of ties that ran through the text. The reader was then asked to fill in the gap with an appropriate word. (In doing this,

the method is a modified or selective cloze procedure, but due to important differences is called GAP to avoid misinterpretation and comparisons with standard cloze procedures.)

The rationale of the procedure is dependent upon the presupposition factor of the cohesive tie mentioned earlier, that is, the identification of some item (the deleted) being dependent on another (usally earlier in the text) for its full interpretation. Very few deletions are made so as to interrupt the story or meaning of the text as little as possible. Typically three or four deletions per page of text to be read were made. If the child replaced the author's word successfully, then it was deemed that the cohesion existing between the clauses had been perceived. The cohesive ties were sampled according to the categories and sub-categories of reference, substitution, conjunction and lexical cohesion.

A collection of classroom books were made (a) from amongst those often chosen by children as their library book choice, (b) from among the books most often read to children by their teachers, and (c) books most often purchased by schools as non-fictional material i.e. information books for the junior children and text books for the secondary children.

About one hundred books were collected and from these a further selection was made so that extracts of some length could be used for the purpose of identifying chains of cohesive ties. These were then further divided into two groups to accord with the two major

registers, fiction and non-fiction. This procedure yielded 61 excerpts which were put, after pilot testing, into four booklets, two for the junior group in Cohort A and two for the older children in Cohorts B and C. It is important to note here that the original intention was to have two booklets for each cohort but it was discovered during pilot testing that sufficient responses were not forthcoming from the children in Cohort C on the materials that are used in their classrooms to make a feasible analysis. Some of the texts from this age group were discarded therefore and the rest incorporated in the materials originally designed for Cohort B.

The booklets containing the Gap deletions in cohesive chains were: Junior Booklet 1 (fiction) containing extracts from 14 books, Junior Booklet 2 (non-fiction) from 19 books, Secondary Booklet 3 (fiction) from 13 books and Secondary Booklet 4 (non-fiction) from 16 books. The length of the passages varied from instances of short paragraphs to two or three pages and there were 60 deletions of cohesive ties in each booklet making a total 120 for each cohort.

Alongside these specially prepared booklets, standardised tests of reading and Ravens Matrices were also administered for comparing the verbal and non-verbal abilities of the project children with standardised samples.

New findings and new directions

Only two of the main outcomes of this on-going research, those which are applicable to assessment, are reported here. Some associated projects are still being carried out and some are still being written up.

1. Chain confusion

The methodology yielded a very large data bank containing thousands of responses. When these were examined the extent of readers' mis-perceptions of meaning were clearly revealed by the response patterns. After analysis it was found that problems often occurred where chains that carried associated threads of meaning came together, or crossed or were juxtaposed in a text. For example, when one of the three chains in the following excerpt from a History text was interrupted and the children asked to replace the ties, the resulting response could be allocated to definite semantic fields which clearly indicated various levels of meaning mis-perception. Part of the passage in question (see Figure 2) was concerned with a Stuart family in the Civil Wars in England. Three lexical chains related to Kings,

Figure 2 about here

Family and Wars came together in and around the clause:

//'Sir Mun/joined/the King's .....'.//

The word was forces and the responses could be clearly identified

with the main threads of meaning as shown by the Semantic Field diagram in Figure 3. But it was only the children in the top third of the reading ability range, as measured by a standardised reading test, that provided answers that conformed to the author's meaning as carried by the interrupted lexical chain.

Figure 3 about here

2. Perhaps the most important and significant outcomes of the research however, is the shift in perspective on the reading process that became necessary when the results were examined in detail. It was no longer satisfactory to think in terms of reading ages or quotients. For the results obtained from charting the reading growth of nearly fifteen hundred children between the ages of eight and fifteen years, show clearly that such concepts are misleading. When their reading responses were plotted year by year it became clear that reading ability was best accommodated along a continuum that stretches from the non- or erroneous perception of the meaning of given selections of texts to the accurate perception of the authors' intended meaning. It is important that any discussion of baseline reading includes the notion of a continuum. Other factors such as critical and aesthetic appreciation can then be taught with a greater chance of success.

For research purposes it became necessary to codify the procedures that produced the continuum. When this formalisation had been achieved it became clear that the Reading Development Continuum (RDC) as it was called (Chapman 1983c, 1985) had two very important

practical implications. Firstly it made possible a new profile assessment system for schools and secondly a learning validation or new readability instrument became available for publications.

The Reading Development Continuum (RDC)

A computer program called RECAT (for Recategorisation) allows the researcher to place each reading response obtained from the children along the RDC (Figure 4) according to its proximity to four major positions and the transitional areas that lie between those positions. When all the responses are so arranged and combined an overall assessment can be made of the class or group, or an individual diagnostic profile can be produced. Alternatively it can be applied to chapters of books, or indeed whole books, to assess their validity as learning instruments.

Figure 4 about here

The four positions referred to are based on the psycho-sociolinguistic model of the reading process mentioned earlier. The characteristics of the responses and the decision making procedures involved are, in summary form, as follows:

Position 1 (P1) the non-perception of the clause element in which the deletion appears.

Position 2 (P2) the perception of the theme-rheme structure of the clause or sentence according to the rank ordering of systemic linguistics.

Position 3 (P3) the perception of cohesion and register of the text.

Position 4 (P4) the replacement of the author's word.

Figure 5 about here

For the longitudinal research each response from the frequency table provided by an associated quantitative computer program (Anderson 1981) is recategorised in this way allowing an interpretation at (1) individual deletion response level (per individual, class group, or whole geographical area) or (2) across a booklet or (3) both booklets - i.e. fiction and non-fiction, or (4) for three years. It is clear that this new assessment system has many applications and is particularly useful for evaluating the progress of children's reading performance on the reading materials actually in use for the curriculum of the school.

Mention needs to be made of the generation of individual profiles. Samples of these in graphic form can be seen in figures 5, 6 and 7. Here the characteristic shapes of the graphs for high, middle and low performers over two years can be seen quite clearly.

Figures 6, 7 and 8 about here

The teacher is made aware of the overall progress of the child according to the RDC placing thus enabling teaching to be principled and, as it is based on the child's own learning materials, much more effective.

Assessing the readability of texts

As indicated above, as the longitudinal programme contined a very large data bank of responses from the tests of tie-chain perception was built up. This makes possible the analysis of parts of, or whole chapters of, books and to map their chaining and then to compare those chain patterns with examples of similar situations in the data bank. Hence it has become possible to advise publishers and authors on those areas of the text where readability is unclear and where learning is likely to be problematic. This learning validation procedure for publishers and the new assessment procedures for schools are two major outcomes of the research.

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Figure 1

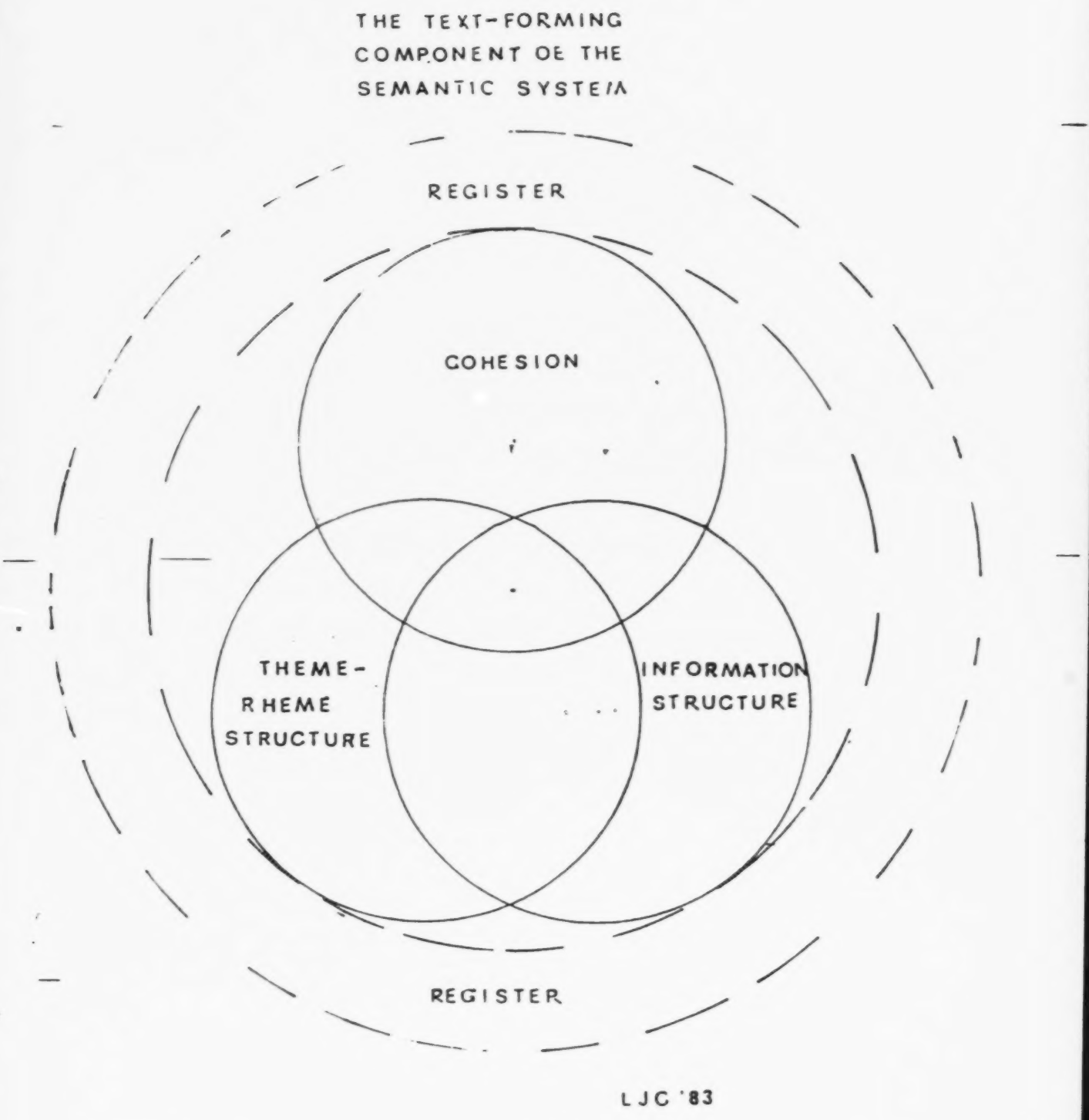

THE TEXT-FORMING
COMPONENT OE THE
SEMANTIC SYSTEM
REGISTER
COHESION
THEME-
RHEME
STRUCTURE
INFORMATION
STRUCTURE
REGISTER
LJC '83

Figure 2

Many great houses were besieged and some burnt down during the Civil War.

Sir Edmund's second son, Edmund, nicknamed 'Sir Mun', joined the King's forces. His eldest brother Ralph sided with Parliament. When Sir Mun heard this news he wrote to his brother

> 'I am so much troubled to think of your being on the syde you are that I can write no more.'

Figure 3

The responses of 807 children arranged into semantic fields cued by the three lexical cohesion chains: Kingship, Kinship, Miltary Allegience

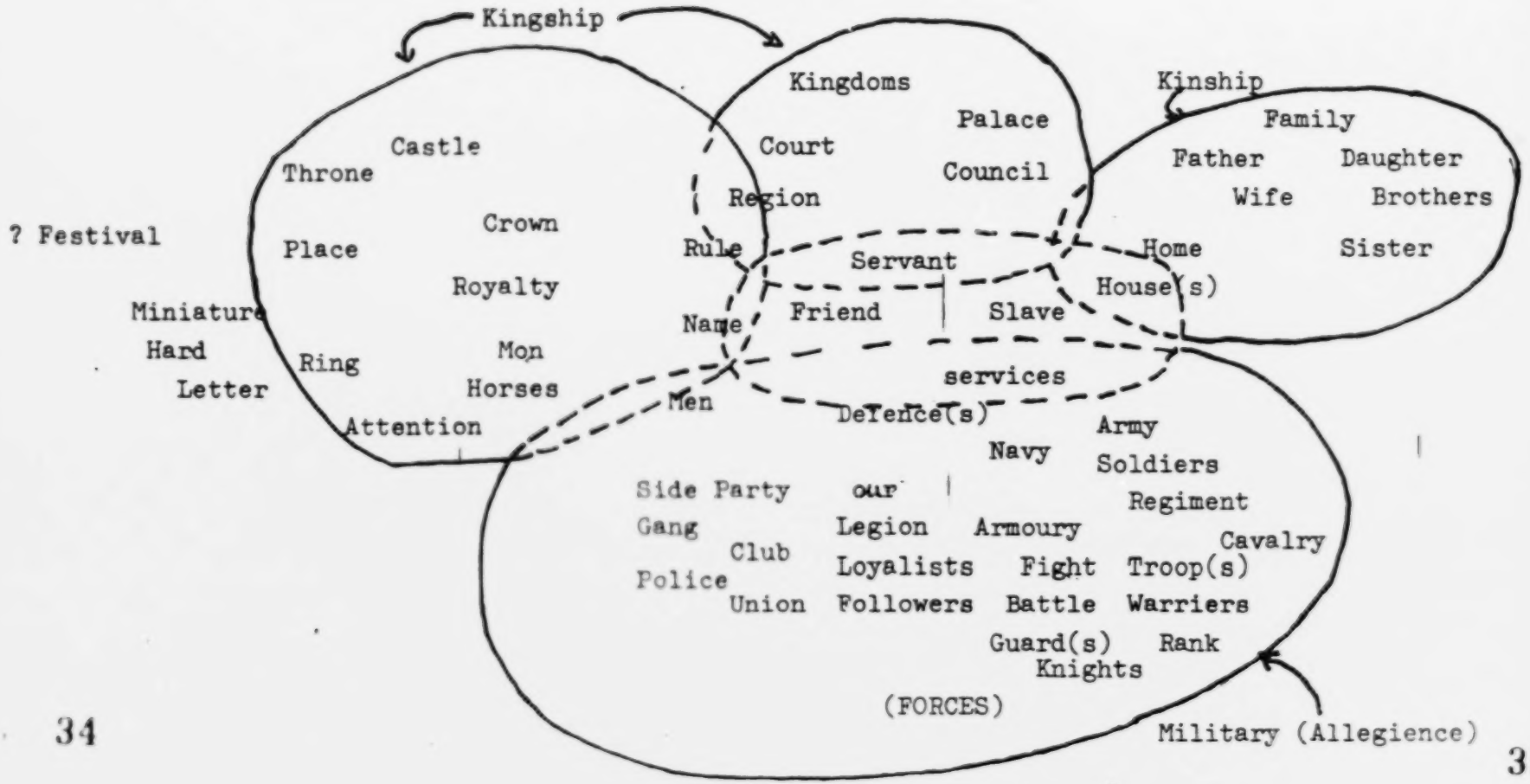


Figure 4

THE READING DEVELOPMENT CONTINUUM

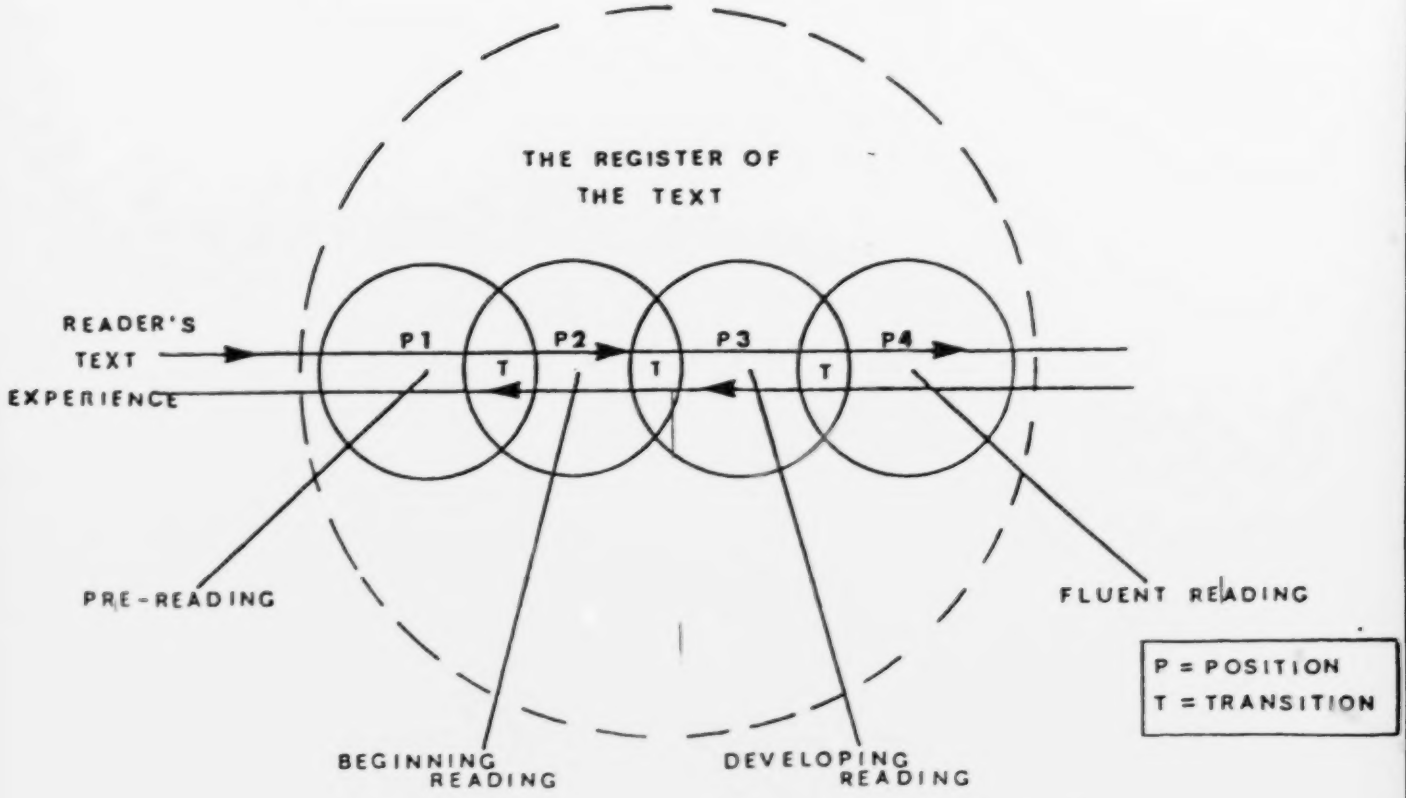


Figure 5

A Reading Development Continuum

(GAP Technique)

Position 1 (P1)

Pre-reading

A. Omissions
B. Unrecognisable responses
C. Responses from V.P.F.
D. Responses unacceptable in 1 Clause Element (1CE)

P1 Transition

E

Response partially acceptable only: achieved by ignoring other word(s) in CE or by over-running punctuation and combining with word(s) from following CEs.

Position 2 (P2)

Beginning Reading (Clause Structure Perceived)

H — Word Complex Responses acceptable in 1 CE only (ie, all other contexts ignored)

I — Group Complex Responses acceptable in 2 - 4 CEs (all other contexts ignored)

J — Clause Complex Responses acceptable in clause (complex) but lacking evidence of cohesion and register.

P2 Transition

K

Responses showing evidence of cohesion and appropriate register but errors in lexicogrammatical structure(s).

Position 3 (P3)

Developing Reading Fluency

P — Responses indicate that clause structure perceived, cohesion perceived but achieved differently from author's, possible register errors of field mode and tenor.

Q — Responses indicate that clause structure perceived, register is appropriate but cohesion achieved differently from author.

P3 Transition

R

Structure perceived. Register appropriate, cohesion perceived but not author's word.

Position 4 (P4)

Fluent Reading

Y

Criterion met (ie matched)

a) author's word

b) teacher's word

Dr L. John Chapman
November 1985

Figure 6

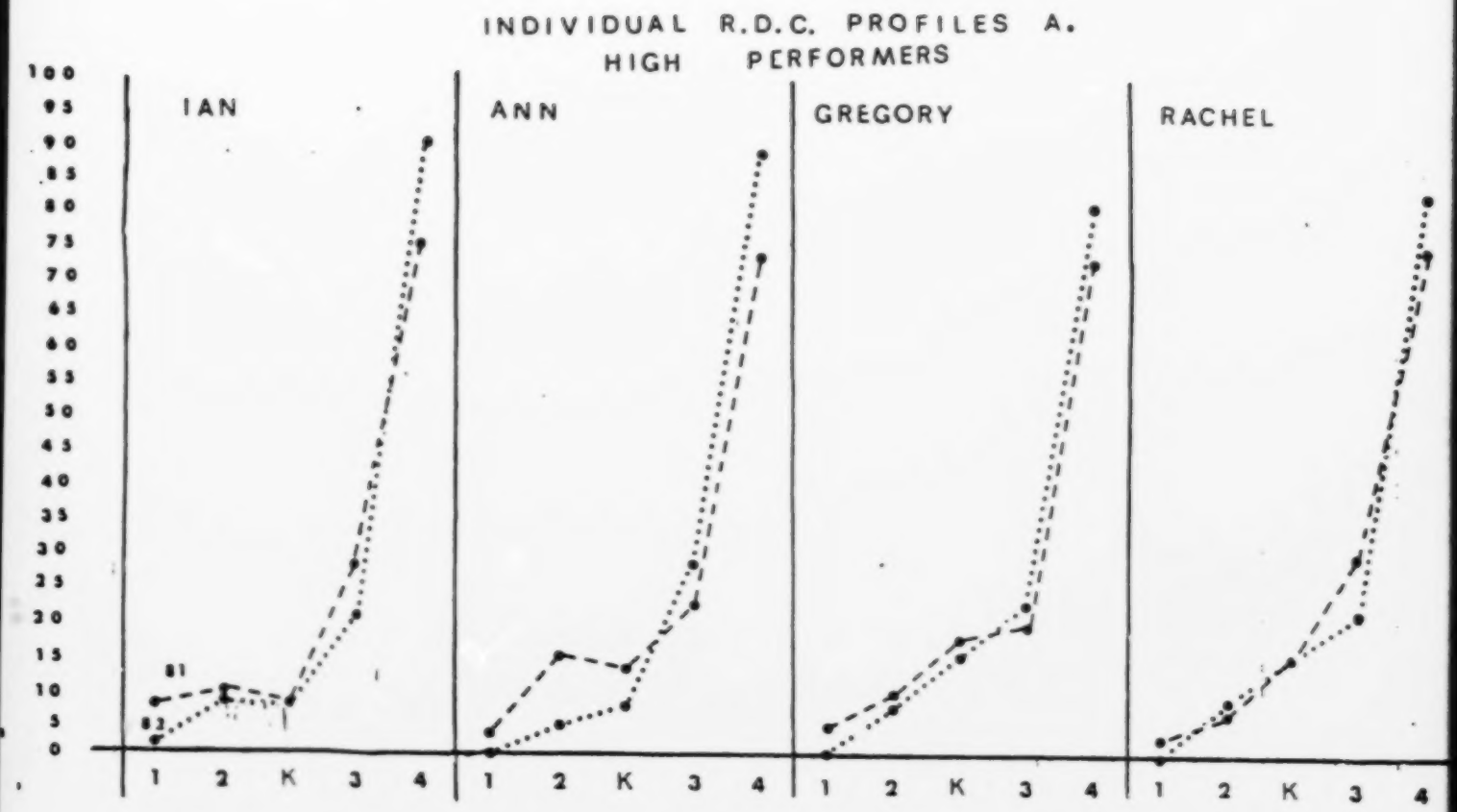
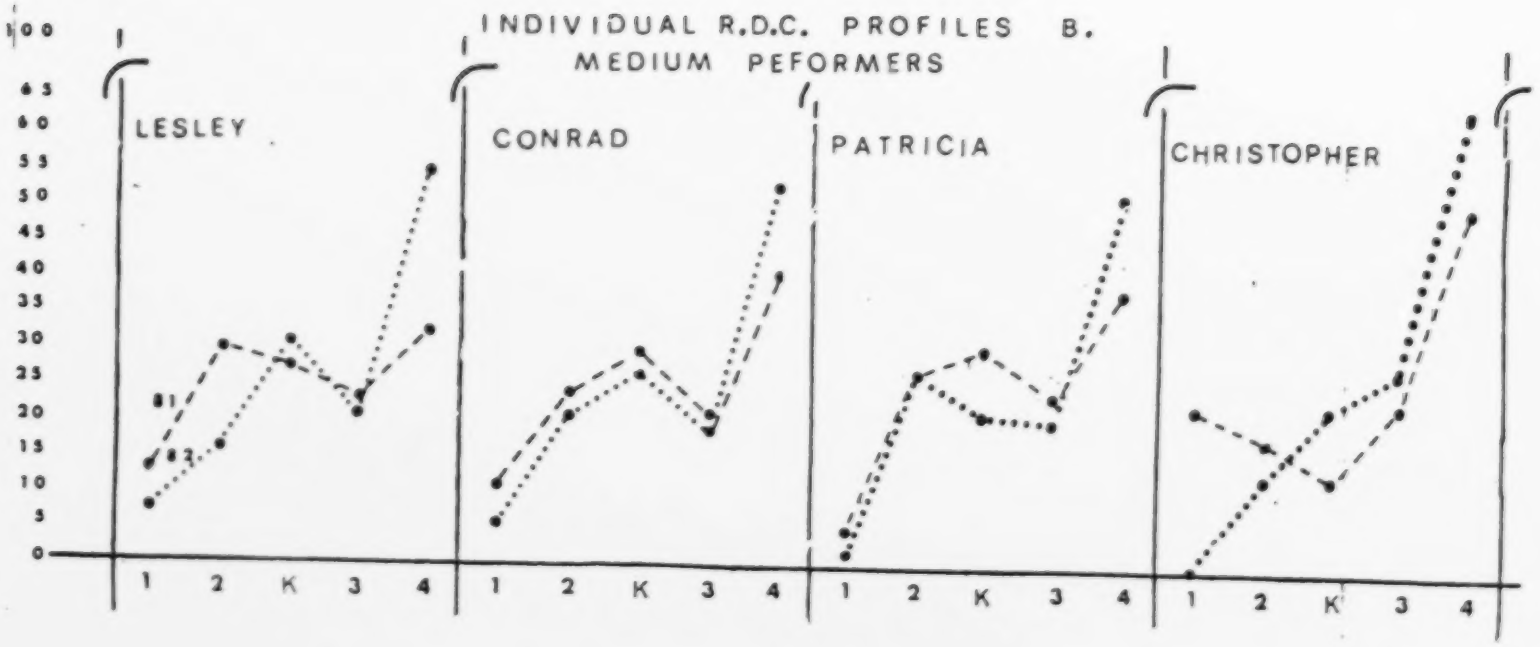

INDIVIDUAL R.D.C. PROFILES A.
HIGH PERFORMERS
IAN
ANN
GREGORY
RACHEL
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
81
82
1 2 K 3 4
1 2 K 3 4
1 2 K 3 4
1 2 K 3 4

Figure 7


INDIVIDUAL R.D.C. PROFILES B.
MEDIUM PEFORMERS
LESLEY
CONRAD
PATRICIA
CHRISTOPHER
100
65
60
55
50
45
40
35
30
25
20
15
10
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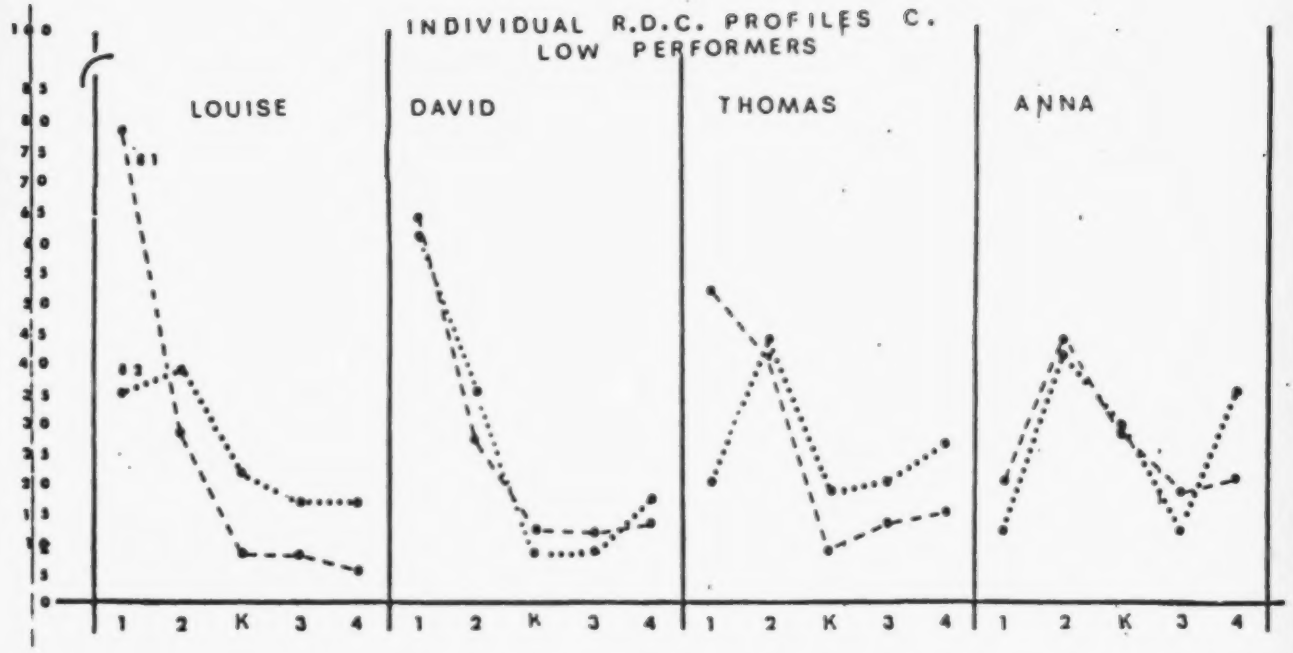
B1
B2
1 2 K 3 4

Figure 8


INDIVIDUAL R.D.C. PROFILES C.
LOW PERFORMERS
LOUISE
DAVID
THOMAS
ANNA
1 2 K 3 4